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U. S. DEPARTMENT OF AGRICULTURE,

BUREAU OF SOILS—MILTON WHITNEY, Chief.

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# SOIL SURVEY OF COSHOCTON COUNTY, OHIO

BY

THOMAS D. <sup>Connelly</sup>RICE AND W. J. GEIB.

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[Advance Sheets—Field Operations of the Bureau of Soils, 1904.]



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[PUBLIC RESOLUTION—No. 9.]

JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

*Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,* That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the Congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1901, the Division of Soils was reorganized as the Bureau of Soils.]

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# SOIL SURVEY OF COSHOCTON COUNTY, OHIO.

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## LOCATION AND BOUNDARIES OF THE AREA.

Coshocton County lies east of the center of the State of Ohio, and occupies a portion of the Muskingum Valley. The county covers about 551 square miles, and is divided into 22 townships, 19 of which contain 25 square miles each, while the other 3 are the irregular townships of Jackson, Tuscarawas, and Linton.

Coshocton, the county seat, has a population of about 7,000. The town is noted for the manufacture of metal signs and advertising novelties. There are also foundries, potteries, and brickyards. A large part of the population is engaged in the coal trade.

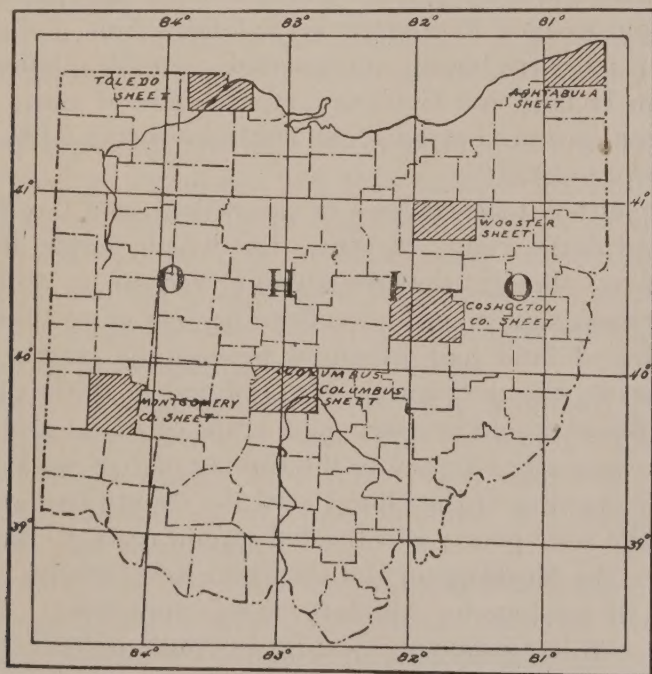


FIG. 1.—Sketch map showing location of the Coshocton County area, Ohio.

West Lafayette, 6 miles east of Coshocton, has a population of about 1,200, and is the center of the most prosperous farming community in the county. Warsaw and Conesville are smaller towns, and there are numerous villages scattered throughout the area.

## HISTORY OF SETTLEMENT AND AGRICULTURAL DEVELOPMENT.

By the treaty of Fort McIntosh, concluded with the Delaware and Wyandot nations in 1785, a large tract, including the area surveyed, was ceded to the United States. Later on, in 1798, a tract designated as the United States Military Land District was set aside by Congress to satisfy certain claims of soldiers of the Revolutionary war. This included what is now Coshocton County. The tract was surveyed into townships 5 miles square, then into quarter townships, and later some of these were divided into 100-acre lots for the accommodation of soldiers having claims to that amount of land.

The first settlement in the county was made 4 miles above the "Forks of the Muskingum" in 1800. The next year settlements were made in Oxford, Franklin, and Washington townships. In 1802 a town was laid out—the present site of Coshocton—and called Tuscarawas; when the county was organized in 1811 it became the county seat and took its present name. As originally constituted, Coshocton County embraced what is now Holmes County, extending to the Greenville treaty line, 6 miles north of Millersburg, but that county having been organized in 1824, the limits of Coshocton County were fixed where they now are. The earliest settlers came from Virginia, Maryland, and eastern Pennsylvania, but later New York and western Pennsylvania were largely represented. Small colonies also came directly from Ireland and Germany, and in spite of many drawbacks the population increased steadily, in 1820 numbering 7,086. By 1850 this had grown to 25,670.

The early settlers took up land in the valleys, and there the virgin soil produced large crops of corn, for which staple it was well adapted. It was thought that the uplands were of no value for agricultural purposes, but when the valleys became more thickly settled and the price of land had advanced beyond the reach of those of moderate means, the newcomers were obliged to settle the uplands, which they found would produce good crops of wheat and grass, and which were especially adapted to the raising of live stock.

Before the opening of the Ohio Canal the county had no outlet for produce except over poorly constructed wagon roads to Lake Erie, or by boat down the Muskingum and thence to New Orleans. The country was full of produce for which there was no market. The portion of the canal within Coshocton County was built in 1827–1830. This marked an important epoch in the development of agricultural and other industries. Wheat rose from 25 cents to \$1 a bushel, while corn, potatoes, and all other produce advanced in proportion. Until the first railroad was built in the county, in 1855, the canal boats did a thriving business, for all freight was transported by them. After this date, however, the traffic dwindled and only a local business was



carried on by the boats. Even this soon died out, and the canal was practically abandoned as a means of transportation. Of late years it has been used to some extent to furnish water power to various manufacturing establishments along its route.

Since its early settlement general farming has been practiced throughout the county. Corn was the principal crop, and as early as the year 1857 more than a million and a half bushels were grown. Wheat ranked next to corn in amount and value. The period of its most successful cultivation was from 1835 to 1850. Later there was serious trouble from winter freezing and other causes, and for twenty years this industry was greatly depressed. Then came a succession of good years, which proved a stimulus, and while the yields were not quite equal to those of the early days, wheat could be profitably grown, and its cultivation is still practiced. Before the civil war tobacco was grown in considerable quantities, but the farmers all began to grow it, the supply soon exceeded the demand, and its cultivation was quickly abandoned and never taken up again on a commercial scale.

In some sections fruit raising has been successfully practiced for over half a century. In 1878, 446,998 bushels of apples and 69,860 bushels of peaches were grown in the county. In 1901 there were 4,640 acres in apple orchards and 1,834 acres in peach orchards in the county. Washington township was, and is still, in the lead in this industry.

Stock raising early proved to be a profitable business, and sheep especially received attention. By 1878 Coshocton had become one of the leading sheep counties in the State and that year produced 490,076 pounds of wool. To-day it is the fifth county in the State in number of sheep kept, and the wool clip for 1901 was 17,000 pounds less than in 1878. The dairy industry has never been developed to any extent, but beef cattle have been raised with success.

In 1850 a county agricultural society was organized and a fair has been held each year since that date. This has had a tendency to bring the farmers of the county into closer touch with each other and to stimulate the introduction of better methods and the production of finer animals and larger crops.

Between 1850 and 1870 there was a marked decrease in the population of the county. The same condition has been noted in other counties in Ohio, especially such as were most largely agricultural. The disposition to forsake the farm for the shop, store, and office, the movement to the newer West, and the enlargement of local manufacturing interests of the towns all had to do with the decrease of population in the rural districts. Since 1870, however, there has been a steady growth, not only in the population, but in the development of all industries represented in the area.

## CLIMATE.

Warsaw is the only station of the Weather Bureau in Coshocton County where records of temperature and precipitation have been kept, but in the following table data are added for Canal Dover. This station is only a few miles northeast of the Coshocton County line, and has practically the same elevation, so that the figures given may be taken as indicative of the climatic conditions of the area.

*Normal monthly and annual temperature and precipitation.*

Month.	Warsaw.		Canal Dover.		Month.	Warsaw.		Canal Dover.	
	Tem- pera- ture.	Pre- cipita- tion.	Tem- pera- ture.	Pre- cipita- tion.		Tem- pera- ture.	Pre- cipita- tion.	Tem- pera- ture.	Pre- cipita- tion.
	°F.	Inches.	°F.	Inches.		°F.	Inches.	°F.	Inches.
January ----	28.1	2.41	28.1	3.25	August ----	71.6	4.36	71.0	2.22
February ---	25.3	1.98	26.8	2.80	September .	65.9	2.41	63.9	2.35
March -----	37.6	3.73	39.3	4.54	October ----	51.6	1.65	50.7	1.89
April -----	50.8	2.31	49.8	2.86	November .	39.6	3.03	40.0	3.82
May -----	61.7	3.50	60.8	3.58	December ..	30.0	2.74	31.5	3.20
June -----	71.2	3.74	68.9	3.30	Year...	50.6	38.50	50.3	39.17
July -----	74.1	4.64	73.0	5.36					

The climate of Coshocton County is that common to the entire eastern and central portions of Ohio, with such slight differences as are incident to variations of altitude. It appears from the above table that during the three winter months an average temperature below the freezing point is maintained. During this time there are periods of intense cold when the mercury may stand below zero for a week or more at a time, sometimes reaching — 20° F. During these months grasses and small plants are usually protected by from 6 to 10 inches of snow. Snow may fall until the latter part of April, but the late snows rarely remain on the ground for any length of time. Spring opens suddenly, and it is not often that much damage is done by untimely frosts.

The summers are short but hot, with occasional periods of oppressive heat. The greatest precipitation occurs during the summer months in heavy local showers.

## PHYSIOGRAPHY AND GEOLOGY.

Coshocton County occupies a portion of the great plateau of eastern Ohio. The surface is sharply rolling and in many places rough and hilly, but the hills maintain a general summit level of from 1,100 to 1,200 feet above the sea, and no point of land rises to any noticeable height above the surrounding upland country. The hills have a dome-like slope, characteristic of the weathering of the sandy shales of the region, and there are no ridges of any considerable extent.



The entire area is drained by the Muskingum River, which is formed near the center of the county by the confluence of the Walhonding and Tuscarawas rivers. The towns of Coshocton and Roscoe have grown up near the junction of these streams. From this point three beautiful and fertile valleys radiate to the county borders—the Muskingum to the south, the Tuscarawas to the east, and the Walhonding to the west. In addition to the alluvial lands of these valleys there are areas along Killbuck Creek, a tributary of the Walhonding River, where a broad valley extends northward, and along Wills Creek, skirting the southern border of the county, while a strip of such land connects the valley of Wills Creek and the Tuscarawas Valley. The latter is probably a former channel of the Tuscarawas River. It may be seen west of West Lafayette, extending along the present valley of the Tuscarawas, from which it is separated by a broken range of hills. It extends southward from the town of West Lafayette and merges into the valley of Wills Creek near the town of Plainfield. The slopes of this valley are several miles in width, and the alluvial land ranges in width from one-fourth mile to 1 mile.

The bottoms along the rivers average almost a mile in width. The sedimentary materials of which they have been built up fall into two general subdivisions as regards position and texture. They are arranged in terraces, five of which may be counted in some places, but usually only three are well marked. The lower bottoms are practically level and so little elevated above the streams that they are subject to overflow in periods of high water. The surface of the land may be washed away or added to by the floods. Such variations may amount to 3 or 4 inches during a single flood. The average deposit is a silty loam, but quite near the river beds of sand or gravel may be thrown down. The second grade of sedimentary deposits occupies the higher terraces above the present limits of overflow. These terraces stand from 40 to 60 feet above the level of the river and have a gently rolling surface. The composing material is a coarse, gravelly loam, with occasional small beds of almost pure gravel.

The hills, with their covering of residual material, rise abruptly above the comparatively level valleys. In some places, as in the upper valley of the Walhonding River, the rocks stand up as cliffs above the stream.

~ Coshocton County lies in the great Appalachian bituminous coal belt, near its western border. The entire area is underlain by sandstones, sandy shales, and limestones of the Carboniferous age. The soils, with the exception of the river sediments already described, have been derived from the weathering of these rocks. Over the greater part of the county the prevailing rock is a sandstone or sandy

shale interspersed with thinner strata of limestone and seams of coal. This formation represents the Lower Coal Measures. The position of the strata is so nearly horizontal that the dip can not be determined, even in a distance of several miles. On account of this feature it is an easy task to trace the coal beds from hill to hill. Along the upper part of the Wallhonding River the barren sandstones of the Waverly group, the lowest subdivision of the Carboniferous, are exposed. No difference is noticeable in the physical properties or productiveness of the soil as the rock changes from one formation to another.

Several coal seams outcrop in Coshocton County, but only one is of any great value. While coal may be seen in nearly every hill, the thickness is variable and the extent of the bed uncertain. In some places the bed attains a thickness of more than 3 feet; in others it pinches out entirely. This discourages mining on a large scale over most of the county, but the easily mined deposits on nearly every farm have given the farmers an abundant supply of fuel for home use, and many of them derive an income by mining coal for the market when the farm work is not pressing.

The sandstone of the area is shaly and easily crushed, and is not well adapted to building purposes. There are several quarries, however, which produce a fair quality of stone for rough building.

Coshocton County lies west of the oil belt. Natural gas has been found between Coshocton and West Lafayette, and the latter town is supplied from the well. The other economic products of a geological nature are deposits of brick and pottery clays, which permit the profitable operation of large plants in different parts of the county.

#### SOILS.

The soils of Coshocton County have been divided into three types. The Dekalb silt loam occupies the extensive upland areas, and the Miami loam and Miami gravelly loam make up the soils of the river bottoms. The area of each type, with its percentage of the total area, is shown in the following table:

*Areas of different soils.*

Soil.	Acres.	Per cent.
Dekalb silt loam .....	320,064	90.7
Miami loam .....	17,600	4.8
Miami gravelly loam .....	15,104	4.3
Total .....	352,768	.....



## DEKALB SILT LOAM.

The Dekalb silt loam occupies the whole of Coshocton County, with the exception of the comparatively narrow stream valleys, and comprises 90.7 per cent of the total area. The texture of the soil is remarkably uniform throughout the area, there being little variation save the slight local changes resulting from differences of topography and drainage conditions. The soil is a mellow loam or silty loam of brown or yellow color. The sand constituent is of the finer grades, and this, with the large silt content, gives the soil the character of a mellow silty loam of excellent physical character. Organic matter is rarely lacking, as the uplands are kept in grasses a large part of the time and leguminous crops have a place where cultivation is continuous. The soil ranges in depth from 8 to 20 inches, with an average depth of 14 inches. The line between soil and subsoil is nowhere sharply drawn. The subsoil may be described as ranging from a silty clay loam to clay. It is not plastic or tenacious. It has a characteristic yellow color, lighter than that of the soil, owing to the lack of organic matter. Over a large part of the area the unweathered rock is encountered at a depth of less than 3 feet. Nearly everywhere fragments of shaly sandstone are scattered through the soil and strewn over the surface.

There are two variations of the type, neither of them being of any great importance. In a few very restricted areas, south of West Lafayette, the sandy shales are somewhat micaceous, and a very fine, smooth loam results from their weathering. In other places loosely cemented sandstones, disintegrating rapidly under the action of the weather, give a more sandy phase of the type.

The Dekalb silt loam covers the whole of the hilly upland already described. There is no considerable extent of level land in the area occupied by this type. The country is more rough and hilly near the streams. The hills rise sharply from the flood plains, and those nearest the water courses have steeply eroded slopes. Farther back from this region of rapid erosion the country presents a more rolling appearance, which characterizes the greater part of the topography of this type.

Naturally such a topography relieves the farmer of all the difficulties of drainage. Nowhere in the region is it necessary to resort to tile drainage. The underlying sandstones, as a rule, are porous and offer no impediment to the rapid percolation of the soil water. A large part of the rainfall sinks immediately into the ground, to reappear below in the numerous springs which are a common feature of the hilly country. The soil is not retentive of moisture, and damage

results from any protracted drought. The rainfall is, however, so uniformly distributed throughout the year that damage seldom results from this cause.

The tendency to wash and gully is not so great as in many soils of similar topography, but it is still an evil that must be guarded against. It is not advisable to put the very steep hillsides in any crop that requires cultivation. The wild grasses which make up the pasturage hold the soil very effectively. Timothy may also be grown on the steeper hillsides. Where the land is cultivated no trouble is experienced on hills of moderate slope if contour plowing is practiced.

The Dekalb silt loam is a residual soil, formed by the decomposition of the sandstones, sandy shales, and limestones of the region. Of these the sandstone seems to have influenced the texture of the soil to a greater extent than the others. The limestone occurs in thin strata, and as a rule the effect on the texture of the soil where these strata outcrop is not noticeable. The so-called limestone soils are considered slightly more productive, especially of grasses, than the soils derived from the breaking down of the sandstones, but no textural differences can be detected. The original rocks that made up the Dekalb silt loam areas contained some iron, and this is manifested in the soil by occasional iron concretions. In some places the accumulations of iron have formed crusts or bodies of kidney ore, but in no locality in sufficient quantity either to be of any economic value or to have any effect on the cultivation of the land.

A general and diversified system of farming is practiced on the Dekalb silt loam. Of the cultivated crops corn, wheat, and timothy are the most important. The yields are not so large as on the river lands, but the farmer is reasonably certain of a fair crop. The raising of sheep and cattle is largely confined to this type of soil. Much of the land is so hilly and stony as to be unfit for cultivation, but the soil is well adapted to grasses, so that the greater part of nearly every farm is devoted to pasture.

In the extremely rough portions of the county the land is still in forests of hardwood. The scarcity of timber has recently caused lumbermen to come into the northern part of the county to get out ties and posts.



The following table gives mechanical analyses of typical samples of the fine earth of the Dekalb silt loam:

*Mechanical analyses of Dekalb silt loam.*

No.	Locality.	Description.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.001 mm.
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
11021	3 miles W. of Co- shocton.	Loam, 0 to 14 inches.....	0.9	5.4	6.7	8.6	8.2	53.5	16.3
11019	2 miles S. of Ba- kersville.	Brown loam, 0 to 12 inches.	.6	2.9	4.1	22.2	12.7	38.5	19.1
11017	4 miles N. of Co- shocton.	Clayey silt, 0 to 8 inches ...	1.1	1.3	.7	1.7	7.3	66.6	21.2
11015	1 mile S. of West Lafayette.	Clayey silt, 0 to 8 inches....	.8	1.5	.8	1.8	9.2	63.1	22.8
11020	Subsoil of 11019 ...	Silty clay loam, 12 to 36 inches.	1.2	2.6	3.1	15.1	12.9	42.6	22.3
11022	Subsoil of 11021 ....	Silty clay loam, 14 to 36 inches.	1.2	4.6	4.0	5.4	6.4	50.3	28.1
11018	Subsoil of 11017 ....	Silty clay loam, 8 to 36 inches.	1.7	2.5	1.1	4.7	16.6	39.5	33.8
11016	Subsoil of 11015 ....	Silty clay, 8 to 36 inches....	1.4	2.1	.9	1.3	4.2	41.3	48.9

#### MIAMI LOAM.

The Miami loam is very uniform in texture for a soil which has been deposited in times of flood by river currents of varying velocities. In its usual development the soil is a loam to a depth ranging from 10 to 20 inches, the average depth being probably 12 inches. The soil is a dark brown in color. The fine and very fine sand which make up the coarser portions of the Miami loam are so combined with silt and clay as to give a soil of excellent tilth. There is always present a good proportion of organic matter to a depth of from 6 to 8 inches. This is especially evident where the land has been devoted for some time to clover, timothy, and the pasture grasses, as humus is well retained. The subsoil is a reddish-brown loam, lighter in color than the soil, as it lacks the organic matter found near the surface. The upper part of the subsoil is usually a clay loam, which becomes lighter with depth. There is often, however, no change in texture between soil and subsoil.

The Miami loam occurs as narrow strips along the Muskingum River and its larger tributaries—the Tuscarawas and Walhonding—as well as along several smaller streams which have developed flood plains. It occurs on the indistinctly marked lower lying terraces, some of which are subject to overflow in times of high water. These

terraces may be flat or gently rolling, and may be broken by small gravel knolls, remnants of the older terraces which have not been entirely removed. Near the river gravel beds occur as recent deposits from the overflow.

In times of average rainfall little trouble is experienced by the farmers in draining the Miami loam. In seasons of protracted rainfall the rivers overflow their banks and submerge the lower levels occupied by this type. If the high water prevails until late in the spring, farming operations are sometimes seriously retarded, as it is difficult to get the soil drained in time to put in a corn crop. The drainage is rapid, however, when the land is once free of standing water. Tile drains are found useful in some places to hasten the removal of the soil water, but their use is by no means general. The upper and more elevated areas of this type are well drained, and the soil is ready for the plow soon after a rain.

The Miami loam is conceded to be the best corn land of the area, and the valleys of the Muskingum and the other large streams of Coshocton County have long been famous for their production of corn. It is claimed by many farmers that the land has deteriorated in productiveness within the last few years, and this to a greater degree than the crops removed would seem to justify, as the soil is constantly recruited by flood deposits. The statement of average yields for the last thirty years does not conclusively verify this view. It is more likely that the occasional short crops are due to climatic conditions or to some unfavorable physical condition of the soil, rather than to any lack of fertility in the soil or in the sediments now being deposited.

The yield of corn is sometimes as much as 60 to 80 bushels per acre. There is some fluctuation in the average yield from year to year, but never what might be termed a failure of crops. Timothy hay is produced in large quantities. Clover is grown to a limited extent. Alfalfa has been tried and found to grow well on this type of soil. On account of its productiveness and easy tillage, the Miami loam is more generally in cultivation than the other types of the area, and little of it is given up to pasture; hence there is less stock raising and more of the hay crop is sold. Tobacco was formerly grown on this type of soil. The plant made a rank growth and the leaf was heavy and dark in color. When the market demanded a lighter quality of tobacco its growth was discontinued and the industry ceased in Coshocton County.

With the exception of stable manure, no fertilizers are used in Coshocton County. The deposits over the river bottoms during the winter months should maintain the soil fertility indefinitely without the necessity of resorting to commercial fertilizers.



The following table gives mechanical analyses of typical samples of the Miami loam:

*Mechanical analyses of Miami loam.*

No.	Locality.	Description.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
11025	2 miles W. of Warsaw.	Brown loam, 0 to 18 inches.	0.2	1.0	1.1	5.0	20.2	50.9	21.5
11027	1 mile S. of Conesville.	Brown silty loam, 0 to 18 inches.	.0	.1	.1	1.9	12.2	60.9	24.8
11026	Subsoil of 11025 .....	Loam, 18 to 36 inches.....	.2	.8	1.0	5.1	14.1	56.3	22.4
11028	Subsoil of 11027 .....	Clay loam, 18 to 36 inches..	.0	.0	.1	2.9	19.7	54.0	23.5

MIAMI GRAVELLY LOAM.

The soil proper of the Miami gravelly loam, to an average depth of 10 inches, is a coarse brown or reddish-brown sandy loam. The subsoil is usually a red loam, containing more clay than the soil. The clay content is small, but sufficient to give the subsoil a slightly sticky property. In some cases masses of gravel are found at a depth of 30 inches. Both soil and subsoil are interspersed with waterworn gravel. The greater part of this gravel is sandstone, but limestone, granite, and occasional quartz particles indicate that the material is not of local origin. Throughout the cultivated portion of the terraces the proportion of gravel ranges from 10 to 30 per cent, but there are small areas where there is little, if any, fine material between the pebbles. These deposits have been utilized to some extent to improve the public roads, and where loam is mixed with the gravel an excellent roadbed is secured.

The Miami gravelly loam occupies the higher terraces along the larger streams. There are two areas where the type is extensively developed. The larger of these is near West Lafayette, on what is known as White Eyes Plain, which is formed where an ancient and disused stream valley runs parallel to the Tuscarawas Valley and finally merges into it. The second area is found around Coshocton, and the broad, level terrace of this material forms a beautiful location for the town. There are numerous smaller areas along the river bottoms. In many places all that is left of the gravelly terrace is a fringe along the hillsides, too narrow to be indicated on the soil map.

The larger areas of the Miami gravelly loam are found on the highest terrace of the series occurring along the streams of the area. The

next terrace, where present, has a considerable area, but usually it is mixed with other soils and is not so true to the type as the soil of the highest terraces. The surface of these areas lies from 40 to 60 feet above the bed of the river, the land being for the most part slightly rolling.

The elevation of the terraces above the river and the character of the materials composing them combine to give the type good drainage. The soil is therefore warm and crops start early in the spring, which is a valuable feature when the spring is at all backward. The power of retaining moisture, however, is weak, and this soil is the first to suffer in case of drought. Fortunately there is seldom serious loss from this cause.

The varied character of the materials composing the Miami gravelly loam and the subangular shape of many of the bowlders indicate that it has been derived from glacial material. It is probable that during the latter part of the Glacial period the swollen streams brought down the débris from the northern part of the State and partly filled the stream valleys of Coshocton County. Subsequent erosion has removed the greater part of this deposit and left the gravelly areas in their present shape.

The early settlers regarded the Miami gravelly loam as leachy and unfit for farming, so that the greater part of this type was left in its native growth of hardwood timber. When land became more valuable this type was brought under cultivation and soon ranked next to the Miami loam in value. Of the cultivated crops, corn is perhaps the most extensively grown and yields from 40 to 60 bushels per acre. Oats are widely grown and the yields are good. The soil is well adapted to alfalfa. Wheat was formerly grown on this soil, but the droughts and insect enemies, which affected the wheat crop so unfavorably throughout the county, were especially harmful on this type of soil. At present the acreage is small and the yields are poor.

The Miami gravelly loam is well adapted to truck. It is probable that as the manufacturing population of the towns increases a considerable number of farmers may profit by growing vegetables for the local markets. At the present time the demand is small, and if such products were shipped to the large cities of the State they would come into competition with truck grown on more favorably located areas of the same type of soil.



The following table gives mechanical analyses of typical samples of the fine earth of this soil:

*Mechanical analyses of Miami gravelly loam.*

No.	Locality.	Description.	Gravel, 2 to 1 mm.	Coarse sand, 1 to 0.5 mm.	Medium sand, 0.5 to 0.25 mm.	Fine sand, 0.25 to 0.1 mm.	Very fine sand, 0.1 to 0.05 mm.	Silt, 0.05 to 0.005 mm.	Clay, 0.005 to 0.0001 mm.
			P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.	P. ct.
11035	$\frac{1}{2}$ mile W. of West Lafayette.	Coarse sandy loam, 0 to 10 inches.	3.3	16.2	18.1	17.3	4.9	29.9	10.2
11033	$\frac{1}{2}$ mile S. of West Lafayette.	Coarse sandy loam, 0 to 10 inches.	9.7	20.3	16.6	11.2	4.2	26.7	11.2
11034	Subsoil of 11033 ....	Brown sandy loam, 10 to 36 inches.	7.1	18.1	15.5	10.7	3.6	33.4	11.6
11036	Subsoil of 11035 ....	Coarse sandy loam, 10 to 36 inches.	6.6	12.2	11.2	15.1	6.7	32.6	15.5

AGRICULTURAL CONDITIONS.

While Coshocton does not rank with the best of the Ohio counties in the sum total of its agricultural wealth, its agricultural interests are very important and still hold the first place among its industries. A most pleasing feature of the economic conditions which prevail in the county is the comparatively equal distribution of wealth among the farmers. As a general rule they own the land they cultivate, and a long tenure has enabled each to secure on his place the necessary buildings, implements, and all things required for comfortable living. The barns and other farm buildings are not large or expensive, but are well constructed and suitable to the needs of the present system of agriculture. The dwellings are usually comfortable two-storied frame buildings. Many new houses have been erected within the last two years, but the log cabin of the early settler may be seen in use in many parts of the county. Slate is invariably used as a roofing material for both dwellings and farm buildings. The general appearance of the country is indicative of prosperity and contentment.

The conditions of agriculture throughout the area are fixed. Fertile but hilly farms, such as cover a large part of the area, have naturally favored a system of general farming, in which the raising of sheep and cattle has held a large place. The variations in the relative proportions of land devoted to pasture and to the production of crops are the only changes which take place in the operations of the individual farmer from year to year. The surplus of produce which the farmer can convert directly into cash is small. As a consequence, he does not have money at certain times, like the farmer who grows a money crop, but the small returns and the constant investment of capital conduce to economy and conservative management, which result in prosperity. The owners of the bottom land have, on an

average, secured the largest returns for their labor, and the most prosperous part of the county is the valley of the Tuscarawas around West Lafayette. There is no unproductive land in the county, but there are tracts so rough and hilly as to prevent cultivation. This is the case in part of the northwestern corner of the county, and here the country presents the least prosperous appearance.

A large proportion of the Coshocton County farmers are landowners. Some land is held on the share-tenant system, but this is usually done by a farmer who has not sufficient lands for his needs, or where the land rented possesses advantages over his own. The holding of large tracts of lands for rent is exceptional. The land is, to a very large extent, in the possession of the descendants of the early settlers. The farmers, and in fact the whole population, are largely of English descent. The only important foreign element is the small proportion of Germans, most of whom are farmers. There have been migrations to the county on several occasions, but there has also been a steady movement away from the farms to the Western lands and to the cities. This movement has only removed the surplus population, and in no case have farms been abandoned or left out of cultivation. When the cheap Western lands were thrown on the market Coshocton County, in common with all the Eastern communities, experienced a decrease in land values, but since the readjustment has taken place there has been a steady increase in the price of farming land. This price varies widely, according to location and agricultural value. The patches of stony, hilly land are almost worthless, while the level river bottoms often bring over \$100 an acre. The average price of a good upland farm is about \$25 an acre, and \$75 an acre is a fair average for the river lands.

The county is divided by the rectangular system into townships of 25 square sections of 640 acres each. The farms are rectangular subdivisions of these sections. The county is more than one hundred years old as regards agricultural development, and the farms have been subdivided almost to the limit of profit in the kind of agriculture practiced. The average farm contains about 100 acres. This is not large when the rough and uncleared land and the large acreage devoted to pasture are considered. As farming land is not held for speculation, each farmer holds only what he can cultivate with the labor at his disposal.

The labor problem does not seriously affect the agriculture of Coshocton County, as very little hired labor is employed on the farms. The system of agriculture requiring but a small acreage of cultivated crops, the farmer is enabled, with the help of his family, to perform the necessary labor of the farm. The price of labor when employed is not high, the usual wage being \$15 to \$17 a month with board. The mining and manufacturing enterprises which have sprung up



in the county have had a natural tendency to increase the wages of all classes of labor. In all, about 1,200 miners are employed in the coal mines, in many cases by the farmers. The miners contend for the scale of wages in force throughout the bituminous coal region. Laborers of all classes are, as a rule, native born, intelligent, and efficient.

The most important crops of the area are corn, hay, and wheat, in the order named. The average annual production of corn is more than 1,000,000 bushels. The greater part of this amount is grown on the river lands. The uplands are not so productive of corn. The average yield for the entire county is 32 bushels per acre.

Wheat was once grown to a greater extent than at present, but frequent failures have discouraged the growing of the crop to some extent. Although the acreage is still about equal to that of corn, the yield is small, the average being less than 12 bushels per acre. Oats are grown to some extent and yield well.

Both timothy and clover hay are grown. Timothy is perhaps better adapted to all the types of soil. Small fields of alfalfa in good condition may be seen in different parts of the county, showing the possibilities of this crop if it should ever be considered advisable to grow alfalfa in preference to the present hay crops.

Nearly all the hay and grain grown in the area is fed to live stock and marketed in the form of animal products. The cattle and sheep are of good breeds and have every evidence of being well cared for. At one time Coshocton stood first among the sheep-raising counties of Ohio, and even now only four counties in the State have a greater number of sheep. The sheep are mostly of the fine-wool breeds.

Cattle are raised chiefly for beef and to supply butter and milk for home needs. It is a remarkable and unfortunate fact that in a country so admirably adapted to grazing the dairy products should be barely sufficient to supply the needs of the local markets, and sometimes inadequate even for this purpose. This can hardly be accounted for by lack of markets, for, besides the possibilities of export to the neighboring towns, Coshocton has a growing demand for milk and butter. Only a few small dairies have sprung up to meet this demand, though they are said to make a good profit. There is, however, a lack of creameries to take the milk from the farms throughout the county.

Coshocton County is well provided with transportation facilities. The wagon roads do not follow the section lines, but are well distributed, so as to reach nearly every farm. The condition of these roads would be much better if they had been laid out to follow the contours of the hills, but as this is not the case they are generally hilly and uneven. The drainage is good, however, and the roads dry

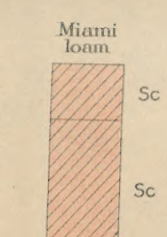
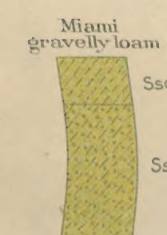
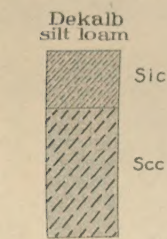
off quickly after rains. With a reasonable amount of work the roads may be kept in fair condition throughout the year.

The railroads are also well distributed. Four lines cross the area. The main double-track line of the Pennsylvania Railroad between Pittsburg and Columbus comes into Coshocton from the east and turns south along the Muskingum Valley. A line of the Wheeling and Lake Erie Railroad also passes through Coshocton, running north and south. A branch of the Pennsylvania traverses the Wallhonding Valley west from Coshocton, and a north and south branch of the Cleveland, Akron and Columbus Railroad passes through Warsaw. The canals were once a great factor in the transportation problem of the area, but they have now been completely abandoned on account of the competition of the railroads.

Coshocton is the best market of the area for all kinds of country produce. The town is backward, however, in providing a convenient market. On Wednesdays and Saturdays, which are market days, the farmers and local dealers dispose of their produce from wagons or hastily constructed shelters on the curb around the public square. Of course, on rainy days the crowd of sellers is small, and housekeepers are much annoyed by their inability to buy supplies. The increasing demand at Coshocton for all kinds of farm and dairy products should cause the town to put every means at the disposal of the farmer to have these commodities supplied by the surrounding country, and to prevent their importation from other counties, which has been resorted to within the last few years.



SOIL  
PROFILE  
(3 feet deep)



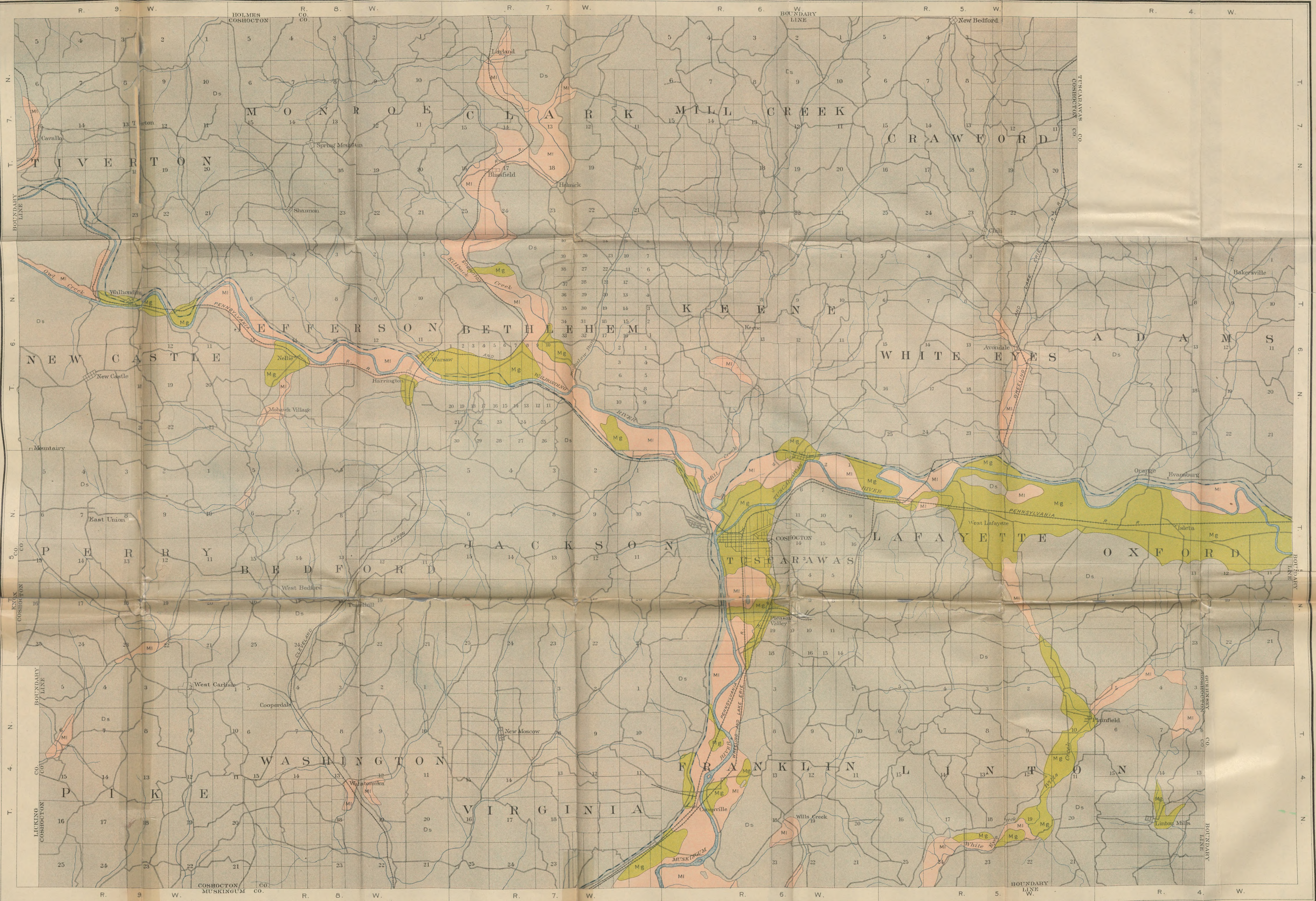
LEGEND  
S1c Sandy loam  
S2c Clay loam  
S1c Silt loam

LEGEND

Ds  
Dekalb  
silt loam

Mg  
Miami  
gravely loam

MI  
Miami  
loam









Date Due

280B

<del>NOV 2 1987</del>	<del>DEC 5 1988</del>
JUN 8 1971	<del>DEC 9 1987</del>
<del>SETTEBONV 1972</del>	6/7/90
<del>CANCELLED</del>	
JAN 18 1981	FEB 17 1992
<del>FEB 1982</del>	JAN 26 1995
	JUN 14 1995

S599  
O3C7R5



The Ohio State University



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SOIL SURVEY OF COSHOCTON COUNTY, OHIO